

USAWC STRATEGY RESEARCH PROJECT

**HOW THE ARMY SHOULD USE LEAN SIX SIGMA AS A TRANSFORMATION  
STRATEGY FOR LOGISTICS IN THE 21ST CENTURY?**

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## **ABSTRACT**

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In a culture such as the military, change is a constant. Transformation of the Army, while participating in the Global War on Terrorism, places increased demands on the Army's logistical capabilities to support the warfighter. Logistic leaders must adopt a strategic vision that allows for continuous improvement in quality, speed, and agility in both industrial and administrative processes. This Strategic Research Project (SRP) evaluates the Army's use of Lean and Six Sigma methodologies as a tool to facilitate change during its transformation process. The SRP reviews proposed strategies of Lean Six Sigma, Effects Based Thinking and Systems Thinking, for creating and sustaining a culture of innovation, training, and facilitation on the application of the continuous improvement toolset, and answers the questions, does Lean Six Sigma meet future needs of the Army and what changes to current systems are required.



## HOW THE ARMY SHOULD USE LEAN SIX SIGMA AS A TRANSFORMATION STRATEGY FOR LOGISTICS FOR THE 21<sup>st</sup> CENTURY?

Army leaders must understand the theoretical value of a systems based philosophy to readiness. Readiness is increasingly perishable. As a result, the Army's strategic plan must successfully address advances in technology, expand information flows, span geographies, time lags in communication, and simultaneous deployments in multiple theaters. There is no single blueprint to a successful strategic plan. The Army's strategic plan should create its ideal future the way the Army wants it to be (rather than others (legislature, economic, social factors) forcing a different future on the Army). The strategic plan requires a shared vision of Army leaders and its soldiers. The strategic plan, with its Key Success Measures/Goals and core strategies must capture the Army vision with strategic consistency, year after year. The Secretary of the Army should establish a Strategic Change Leadership Steering Committee to manage the overall change necessary to achieve his vision. All major changes going on in the Army ought to be under its guiding umbrella. The Army must avoid the appearance of "planning on the left and managing on the right?"<sup>1</sup>

The road to successful transformation of the Army is far from clear. Skeptical reception by Army leaders can skew the approach and prompt critics to charge that Lean Six Sigma as a business transformation is cautiously mechanistic or not much different than earlier versions of process improvement systems. This strategic research project (SRP) reviews strategies of Lean Six Sigma, Effects Based Thinking, and Systems Thinking, and answers the questions, does Lean Six Sigma (L6s) as a tool for business transformation meet future needs of the Army and what changes to current systems are required.

The Army should not present L6s as a bumper sticker to yet another process management solution. Army managers may see this as just another Total Quality Leadership (TQL), Total Quality Management (TQM), or International Organization for Standardization 9000 (ISO 9000), as another flavor of the month. The Army should be wary of L6s appearing to be the new "cottage industry" for consulting firms. Doing a quick "google" search on the internet for L6s consultants provided in excess of 676,000 results. The Army must first, determine what is the criterion used to select the consultant for L6s, and should apply lessons learned from industry's deployment and use of L6s. Finally, Army leadership needs to address what alternatives are available in lieu of L6s.

## Background

Albert Einstein once said “We cannot solve our problems with the same thinking we used when we created them.”<sup>12</sup>

Secretary of Defense, Donald H. Rumsfeld provided implementing guidelines for strategic planning in the *National Defense Strategy of the United States of America*. He states: “We will continually adapt how we approach and confront challenges, conduct business, and work with others.”<sup>13</sup> The Secretary’s purpose for continuous transformation is to extend key advantages while reducing vulnerabilities.<sup>4</sup> Secretary Rumsfeld highlighted the need to change long-standing business processes within the Department of Defense taking advantage of information technology. He seeks to foster a Defense Department culture of innovation while transforming our business applications, requiring leaders to continually adapt their approach to the challenge of supporting a globally deployed warfighter.<sup>5</sup>

To meet this challenge for transformation the Secretary of the Army established the first Executive Director for Institutional Army Transformation. The Office of the Executive Director for Institutional Army Transformation in conjunction with the Deputy Chief of Staff G8, PAED, is responsible for the institutionalization of Lean Six Sigma (L6s) as a methodology for transforming the Army.

The Secretary and the Chief of Staff of the Army must find the right qualitative management tool to transform the Army Staff and in its major commands (MACOMs). The ends of this transformation strategy would be the successful employment of a business process that would stream line business processes and eliminate waste while reducing variation and redundancy. There are three keys for the criteria used to determine which course of action the Army should use to successfully effect business transformation; first, the qualitative management tool must have a shared direction and position within the organization; second, have a strategic business design; and third a method to implement the strategic change.<sup>6</sup> Once the Secretary and the Chief of Staff select the best approach, they must provide the means or resources to implement the business process transformation.

The Office for Institutional Army Transformation published a draft 124 page (Version 1.0) Business Transformation Planning Guidance on 25 October 2005.<sup>7</sup> The Executive Summary noted the Business transformation Planning Guidance purpose as:

... to frame the overall Defense business transformation approach, to clarify roles of participants, to establish a common process to govern, manage, plan, and execute business transformation at all levels, ....<sup>8</sup>

General Schoomaker, recently announced his top three priorities for the Army in FY 2006.<sup>9</sup> The Chief's Third Priority is to accelerate business transformation and process improvements. In this light, the Secretary and the Chief of Staff of the Army have enlisted the Army's top commanders to spread Lean Six Sigma doctrine. During our AY06 Senior Leader day here at AWC, many Department of the Army senior leaders used this new term during their talks with the Class of 2006. However, the Army's reliance on L6s as "the way" to accomplish one of General Schoomakers' top priorities for 2006 is shortsighted. L6s alone will fail in transforming business processes of the Army. The Army must seek an alternative that when combined with L6s is accepted by soldiers and leaders as an effective qualitative management philosophy.

Lean is a philosophy and ongoing effort to reduce waste throughout every process. Lean manufacturing is a systematic approach to identifying and eliminating non-value added activities through continuous improvement of processes. Waste elimination equates to increased process speed.

Lean thinking provides a way to specify value, line-up value-creating actions in the best sequence, conduct these activities without interruption whenever someone requests them, and perform them more and more effectively. In short, lean thinking is lean because it provides a way to do more and more with less and less—less human effort, less equipment, less time, and less space—while coming closer and closer to providing customers with exactly what they want.<sup>10</sup>

Six Sigma is a statistical measure of variability, typically in a given process. In manufacturing, for instance, it could be used to measure the number of sub-standard products. In a service industry, it could quantify delays in delivery or other procedures. Six Sigma is a business improvement process that continually strives for perfection. Six Sigma manufacturing involves a disciplined methodology for eliminating the wastes of defects or variance to lower costs and improve customer satisfaction.<sup>11</sup>

By looking at projects through both lean and Six Sigma lenses, you have precision, and actionable tools needed to find hidden problems while making sure you don't overlook the obvious. Lean initiatives are great for boosting productivity, changing a culture and cleaning up factories, but what tools do they offer when it comes to fixing unseen quality issues? Lean brings action and intuition to the table. Six Sigma uses statistical tools to uncover roots causes and provides metrics as mile markers. A combination of both can provide the tools to create ongoing business improvement.<sup>12</sup>

Lean and Six Sigma are like having a wide angle and a telephoto lens. Lean thinking lets you see the big picture, while Six Sigma zooms in on problem areas. Lean thinking is system

focused, easier to implement, and gives quicker results, while Six Sigma is issued focused and can handle more complex problems. The combination of Lean & Six Sigma gives you the best of both worlds.<sup>13</sup> Lean Six Sigma by itself is a mechanistic qualitative management process that does not consider the behavioral aspects of the people who use it. The Army should look at alternatives that include behavioral characteristics of the people who use it. The Army has initiated training and employment of Lean Six Sigma (L6s) as one method for Army business process transformation, two other alternatives for the Army to consider are systems thinking and effects based thinking.

#### Analysis

Using L6s our senior leaders are examining and reexamining our transformation strategy for logistics and its impact on the Global War on Terrorism, modularizing the current force, and the resetting, within six months return on station, the redeploying forces from South West Asia.

The Army's most senior Logistic leaders, like General Benjamin S. Griffin, Commander, Army Material Command understand the challenge of supporting the warfighter by providing the force with the resources, material and equipment required to be on point for our nation. AMC is demonstrating a successful business transformation as it manages the financial resources AMC applies to the warfighter. AMC is not doing business as usual; General Griffin is leading strategic change of AMCs major subordinate commands' business philosophy and practices by applying L6s. AMC and its Industrial Base<sup>14</sup> utilize L6s to provide critical support to the soldier by incorporating commercial best practices to achieve unprecedented savings, optimized production capability, and improved quality and increased customer buying power.

AMC's intent in deploying L6s is to establish a program improving quality, speed, and agility of their industrial and administrative processes. AMC's program of continuous improvement (CPI): recognizes the warfighter as their ultimate customer; reaches every product and every person in the AMC enterprise; extends beyond AMC boundaries unto every component of the supply chain; and uses L6s as the continuous improvement "starting point" while adapting other best practices to unique demands.

To accomplish this deployment and its attendant strategies, AMC established a deployment team to accomplish the following specified and implied tasks: establish an "umbrella" program which can be tailored to the needs of AMC headquarters (Hq) and each of its major subordinate commands (MSCs) Life Cycle Management Command (LCMC); conduct training for HQAMC and MSC/LCMC Executive Steering Groups (ESG); conduct training for project sponsors; conduct Green,<sup>15</sup> Black<sup>16</sup>, and Master Black Belt<sup>17</sup> training in L6s for selected



personnel; conduct familiarization training for all other AMC personnel; use the Green, Black, Master Black Belts to guide AMC teams to improve industrial and transactional processes; coordinate L6s initiatives throughout AMC; provide expert consultation and facilitation on the application of the continuous improvement tool set; develop metrics to monitor projects and the overall program; establish a Command-wide management review system; and develop strategies and action plans for creating and sustaining a culture of innovation.<sup>18</sup>

AMC felt changing its' business philosophy, and business practices, using a combination of Lean and Six Sigma was vital to the Army transformation of the industrial base and providing sustained superior performance in support of the warfighter. AMC targeted twenty-one different manufacturing projects at its five industrial depots, and twenty-eight selected non-manufacturing/service projects at AMC Headquarters, and its major subordinate commands as L6s pilots.

Senior leaders should examine and reexamine our transformation strategy for logistics and its impact on the Global War on Terrorism. Using L6s alone as a tool for business transformation to meet the Army goals is not enough. L6s alone will not transform AMC's depot maintenance and supply distribution into a World's Best maintenance, repair, overhaul and supply distribution facility. It is the people who do the work, who use the systems, who provide the services that will make or not make the improvements. The Army's use of Effects Based Thinking as a tool to facilitate transformation is a viable alternative to the mechanistic approach of L6s.

Effects-Based Thinking is a relatively new but powerful planning concept, requiring us to begin each new task with the end state clearly in mind. It allows us to continually monitor progress against a discrete set of metrics, reallocating resources or effort as required achieving concisely stated desired effects.<sup>19</sup> Effects Based Operations (EBO) specific terminology is intended to support an integrated approach to current decision-making processes. Army Senior Leaders can apply the EBO construct above to line and staff functions as well as industrial relations with depots, contractors and service industries. Synchronizing elements of national power the Army can influence legislative, economic and social actions providing a fully collaborative informational environment that support and resource our national objectives.

The Army's EBO must rely on a comprehensive system-of-systems understanding. The Army must employ the concept for Operational Net Assessment (ONA). The use of ONA integrates people, processes, and tools that use multiple information sources and collaborative analysis to build a common, shared, holistic knowledge base of the operational environment.<sup>20</sup>

This continuous, active process produces a rationale, and relevant knowledge environment, as well as supporting tools, for planners and decision-makers to focus organizational capabilities.<sup>21</sup>

The Army can use ONA as a process and product that can accomplish this system-of-system PMESII (political, military, economic, social, information and infrastructure) analysis. The system-of-systems analysis (SoSA) is an important sub-process of ONA. Within the SoSA process the manager can produce a nodal analysis which, along with effects development, forms the basis for coupling nodes (N) to effects (E), actions (A) to nodes, and resources to established E-N-A linkages. An example would be the COCOM Commander and his staff's use of SoSA as a multi-dimensional approach to understanding the battlespace, characterized by an analysis of six interrelated PMESII systems. Within each of these systems are nodes (a person, place, or physical thing that is a fundamental component of the system) and links (the behavioral, physical, or functional relationship between the nodes). SoSA identifies the relationship between nodes within individual systems and across systems. These nodes and associated links are then identified for DIME (diplomatic, information, military and economic) actions to influence or change system behavior and capabilities in order to achieve desired results. The result is a staff providing a COCOM Commander with a plan that, through a common vision and shared purpose, achieves a high degree of unit of effort by harmonizing the DIME actions to influence or change the PMESII (political, military, economic, social, information and infrastructure) systems within the operational environment in order to achieve the desired results.

An integrated and rigorous assessment process is a critical element of effects based thinking. The primary purpose of assessment is to identify progress toward accomplishment of objectives at any point in time, which provides basis for plan adjustment. Effects based thinking uses measures of performance (MOP) and measures of effectiveness (MOE) to assess task accomplishment and effects attainment, respectively. Measures of performance answer the question: Was the task or action performed as the commander intended? Regardless of the effect, did the action produce the outcome required by the specified or implied task? Effects based thinking uses MOP as a starting point for effects based assessment in that the commander expects to see results of desired influence or changes in system behavior after assigned tasks have been accomplished. Bottom line is MOP addresses the question: Are you doing things right?<sup>22</sup> MPO focuses on task accomplishment while MOE focuses on effects attainment. MOE show the impact that the commander's completed actions have had in attaining the behaviors the commander desired. MOE addresses the question: Having done things right, are we doing the right thing or are additional or alternative actions required?

Clausewitz wrote about the need to relate ends and means in, *On War*. He acknowledged that there will always be a series of lesser aims that leaders attempt to achieve in order to reach the decisive end. Further, he noted there was a correlation of ends and means at each level if there is to be a realistic weighing of the costs and benefits.<sup>23</sup> Commanders and staff must apply Clausewitz's understanding of ends & means to discern the differences between "task accomplishment" and "effects attainment" MOEs that measure changes to PMESII systems. MOPs and MOES are used collectively providing assessment of operational performance while identifying trends that can affect future operations. Effects based thinking using a system-of systems view of management of command – its current state and end state providing focus on ends to means alignment while addressing how best to incorporate a systems approach relative to understanding the complex relationships in the operational environment. Another system of systems view of management used by the Army is Systems Thinking.

Systems thinking provide the leader/manager the ability for seeing the whole and not just the part. System thinking allows you to see interrelationships rather than just a product or a service, for seeing patterns rather than the still "snapshot". The complexity of a global war on terrorism can be overwhelming. System thinking allows the leader to see "the framework" that holds up complex situations, and the ability to discriminate between high to low level change.<sup>24</sup> Analysis alone will not support understanding of the systems approach. The key to understanding the application of systems analysis is synthesis. Synthesis leads to the systems approach. Three steps to systems approach are: first, identify a system; second, explain the behavior or properties of the whole system; and third, explain the behavior or properties of the things to be explained in terms of the role(s) or functions within the whole.<sup>25</sup>

The Army has applied Systems Thinking as a strategy for Senior Level Leadership. Senior leaders must know when a system or process has outlived its usefulness or when it is operating as designed, but against the overall purpose for which the activity was established.<sup>26</sup> The nature of the Army is very complex; there is no miracle problem solver with one solution that will fix all problems. Sociologist Robert K. Merton coined the terms "goal displacement" when compliance with bureaucratic processes becomes the objective instead of focusing on organizational goals.<sup>27</sup>

Few of us would disagree, as Senior Leaders we must not only see the parts, but also the big picture. But why do Senior Leaders often overlook the big picture? It is just because the Army is so "busy". Is the speed in decision making and decisiveness (so valued at the tactical level) working to the detriment of good decisions at the strategic level?<sup>28</sup> We must think in terms of feedback loops as a substitute for simple cause and effect relationships. Imagine a

commander who determines that high maintenance failures of the turbine engine on his units' Blackhawk helicopter flying in Iraq was due to sand ingestion from the props kicking up loose sand. The conventional approach is to replace engines as they fail. As additional failures appear, the commander continues to replace engines. The commander's goal is to keep his fleet of Blackhawk's in the air doing their mission to support the warfighter, but his replacing engines consume available engine spares costing hundreds of thousands of dollars and keeps Blackhawk's out of the fight. He is busy, but is he being truly productive. Senge suggests a system thinker might step back from the problem, take a broader view, and consider what is happening over time.

Using systems thinking approach the commander and his staff might look at any maintenance failure patterns that appear over weeks or months, attempt to depict what is really happening, and identify root causes or leverage points suggested by these observations. The systems thinker might notice that the sand sucked into the turbine engines over a period of time would lodge in the crevices of the engine and cause it to lock up. Applying a screen and establishing a daily maintenance service to blow out with high pressure air the turbine engines upon return from missions could extend the life of the turbine engines operating in a desert environment.

Systems thinking make it extremely effective on the most difficult types of problems to solve. So many important problems that plague Army leaders today are complex, involve multiple actors, and are at least partly the result of past actions that were taken to erase them. Dealing with such problems is difficult and the results of conventional solutions are often poor enough to dissuade the prospects of ever effectively addressing them. One of the key benefits of systems thinking is its ability to deal effectively with just these types of problems and to raise our thinking to the level at which we create the results we want as leaders, commanders and organizations, even in those difficult situations marked by complexity, and the absence of immediately apparent solutions. While system thinking provides continuous assessment process essential in a volatile environment it requires critical thinking. To be successful in employing another qualitative management program the Army should consider alternatives that complement each other as a systems of systems architecture.

#### Courses of Action

The Office for Institutional Army Transformation developed a strategic plan using L6s as the premise for change and published the Business Transformation Planning Guidance (Version 1.0). It provided a shared vision, values, and core strategies with a clear future positioning for

how the Army should use L6s in its service (including Headquarters staffs) and industrial operations. L6s employment is still relatively new management tool for the Army. The Army must continue to develop clear and focused organization-wide action priorities for the next and ongoing years. It is developing a plan for buy-in and stay-in for applying L6s through an ongoing training and education program, developing black belts and green belts to facilitate and carry forward the transformation process. Key senior leaders at the Pentagon, and in MACOMs, throughout the Army are using training dollars provided through the Office for Institutional Army Transformation to kick start this program.

The Army has conducted a strategic business assessment and redesign using the L6s model, and it has selected Army Material Command as one of the first major commands's to use L6s. It has reviewed the initial results and now is implementing L6s via the Mike George Group (Lean Six Sigma Consultants) as the training team to assist with deployment of this management strategy. The Office for Institutional Army Transformation through its Business Transformation Guidance ensured integration of its policies and parts, people system and business processes of the organization. The Army is directing the use of L6s, to cascade down organization work plans, budgets, and accountability eliminating waste and reducing variation and defects.

The ruling is still out on how successful the Army has been in the implementation of L6s. However, for the Army to be successful it must know and adhere to the roles for implementing strategic change. Leaders must focus on content and consequences and support cadre must be responsible and accountable for L6s processes and infrastructure coordination. The Army must develop a follow-up structure and process as part of their Balance Scorecards, reporting levels of success to senior leaders at all levels of command. The objective would be to track, control, adjust, and achieve plan and key success factor results.

The Effects Based Thinking approach results in the creation of a critical mass for change, building a command-wide commitment to achieving and implementing the strategic plan, through a common vision and shared purpose, achieving a high degree of unity of effort by harmonizing the DIME (diplomatic, information, military and economic) actions to influence or change the PMESII (political, military, economic, social, information and infrastructure) systems within the operational environment in order to achieve the desired results.<sup>29</sup>

To be successful, deployment of effects based thinking strategy must have a communication plan that highlights a command-wide plan reflecting the strategic planning priorities for the first year. The annual budget must be aligned to reflect the strategic planning priorities. All subordinate command and staff plans must be built around the command-wide

annual priorities or goals. The commander or senior primary staff leader must build a yearly road map, or master work plan, for 12 month implementation and follow-up. Leaders must identify key success measures and a reporting system to use with the Army's balance scorecard process. Further, leaders must revise military and civilian performance objectives to meet the adjusted strategic vision, core strategies, and values. Finally the commander must educate his staff building an internal support cadre with the expertise and skills to coordinate, plan, execute, review and synthesize the strategic plan's implementation and change management.<sup>30</sup> Effects based thinking ensures critical thinking and analysis for the commander and his staff. While L6s's goal is to reduce waste, redundancy and use statistical tools as mile markers to uncover root causes, successful employment of effects based thinking provides a clear definition of an attainable end state and objectives using a systems approach understanding to affect the strategic development process.

The Army has also applied Systems Thinking as a strategy for Senior Level Leadership. Senior leaders must know when a system or process has outlived its usefulness or when it is operating as designed, but against the overall purpose for which the activity was established. Using a Systems Thinking approach, leaders must prioritize the organization's core strategies; create or support annual plans that contribute to organization-wide implementation of these core strategies; and commit to a large group review. This review should be a 1 to 2 day team building meeting, off site, in which collective leadership (i.e. my top 30 to 60 people) reviews and problem-solves the annual plan. Leaders should review how their organization's budget and resourcing allocation support the implementation of the strategic plan, provides Key Success Measures/Goals, and core strategies, that enable the organization to find and run day-to-day business, as well as funding and necessary future changes. Finally the review should address how the command looks for ways not only to cut costs, but also increase productivity while reducing redundancy?<sup>31</sup>

Leaders should prioritize strategic action items under each strategy; use the core strategies as the organizing principles of the strategic plan. Each element of command and staff must develop annual plans, including all senior leader staff chiefs. Leaders must implement a performance management system and supporting appraisal form that enables individuals to set goals based on the strategic plan, while taking accountability and responsibility for their part in the overall plan. To consistently gain buy in and stay in, leaders must create a rewards and recognition system that reinforces employee/team/command commitment, and rewards contribution, while encouraging success with specific, tangible rewards and/or recognition.

### Recommendation

Prior to implementing Lean Six Sigma, Effects Based Thinking, or Systems Thinking, the Army must review how industry has applied qualitative management practices, and then provide case analysis to capture lessons learned from industry. Army senior leaders must look at the pro's and con's of applying qualitative management programs ensuring time, effort and funding meets the ends the Army was to reach: the ends of this transformation strategy would be the successful employment of a business process that would stream line business processes, eliminating waste while reducing variation and redundancy.

2001 found Honeywell combining Lean and Six Sigma in a program they called "Six Sigma Plus". Jeff Osborne, Honeywell Aerospace's vice president noted: "Although Honeywell had made great progress, Six Sigma was viewed as a side dish and not an entrée."<sup>32</sup> When Honeywell began its Six Sigma journey, it made a conscious effort to incorporate the Six Sigma vernacular into the corporate language. However, Six Sigma soon became an entity onto itself. Individuals became so involved in staying within the program that some lost touch with the leader's priorities. To refocus and realign, Honeywell had to stop and regroup. To accomplish this they went outside their workforce recruiting top talent.

You must measure the success of Six Sigma by watching the movement of the business gauges rather than merely Six Sigma activity. First, create a clear causal relationship between projects and business performances, and then you have a reason to celebrate.<sup>33</sup> One can never overstate Six Sigma benefits. Math wins every time. Honeywell spent a substantial amount of time to measuring cost avoidance and non-value-added savings generated from Six Sigma projects. Caution should prevail as statistics can have several meanings. Six Sigma must tie into the organizations financial record.

At Honeywell Six Sigma leaders are recognized for "moving the needles for the business gauges that squarely matter to the vice presidents," project selection is owned by senior leadership, not by Six Sigma. Having business leaders set the improvement initiatives ensures that the Black Belts and Lean experts accomplish the goals of the business. Self-selected projects are one of the greatest failure modes Six Sigma experts make. Bottom line leaders must establish the end state using the Six Sigma toolkit. Leaders must be cautioned on setting a specific financial target for Six Sigma resources. When Black Belts work on projects solely to reduce costs, for instance, business needs may be ignored and savings may be overstated. Focus on application instead of certification. A lesson learned for Honeywell was that certification is the beginning and not the end. "Certification proves that you have a proficiency in

a skill set such that you can now apply these skills with confidence." Behavior (use of Six Sigma) is a function of what is to be measured and what we reward, so reward application."<sup>34</sup>

The Six Sigma vision and strategies must be a subset of the business vision and strategies. By directly aligning the Six Sigma strategy with the command strategy, the personal objectives of the Six Sigma team serve and benefit the command as a whole. Honeywell business leaders included Six Sigma in their management operating system, balanced scorecard, and day-to-day language in order to illustrate for employees their commitment. The Army must understand these lessons learned at Honeywell. Six Sigma has one purpose: to serve the organization. The organization does not serve Six Sigma. The most beneficial aspect of employing Six Sigma, is understanding its place and purpose within the command. Leader's commitment must be to the command's performance, not to the means that take us there.

Successful L6s application requires committed leadership, education, and institutionalization. L6s applies its basics to itself, i.e., just as L6s is used to continuously improve other processes, it should be used to continuously improve the improvement process. Lean Six Sigma best meets the future needs of the Army when combined with other quality process improvement techniques. Radical improvement and sustainability programs appear to be given's in today's Army environment. Leaders must decide which discipline, or combination of disciplines, can address their needs for continuous process improvement. Paul Stimson, of Work Systems Affiliates, International, Inc., described the failure with L6s as its assumption that Six Sigma can control people. Six Sigma does not take into account the variability of people. Six Sigma can not control people like robots. People over time find ways around working with metrics and statistics. Bottom line, people can not be controlled at the same tolerance of machines.

The conflict with Six Sigma is its' processes are mathematically précised versus human beings who will just "muck it up".<sup>35</sup> Mike George, Dave Rowlands and Bill Kastle tell us in their conclusion that one of the mistakes made by previous improvement methodologies was to ignore management support. Initially management felt L6s "stole resources" that hey would rather devote to "real work."<sup>36</sup>

The Army must follow industry practice of adding another system with Lean Six Sigma. "Raytheon 'Six Sigma' is the company's own mix of lean, six sigma and other quality improvement methodologies."<sup>37</sup> Using Lean Six Sigma with High Performance Organization principles provides a powerful combination for improvement. Lean principles are easy to learn and provide rapid improvements. Six Sigma contributes advanced statistical tools and formal ties to the management system while High Performance Organization principles directly



reshape the culture, organizational structure, and people's mindsets.<sup>38</sup> Even the Army's draft Business Transformation Planning Guidance suggests assessing progress using performance metrics and other DOD checkpoints. L6s can not be the answer to all problems. "You measure the business results, not Six Sigma activity."<sup>39</sup>

### Conclusion

This SRP has reviewed Army strategies of Lean Six Sigma, Effects Based Thinking, and Systems Thinking, as a tool for business transformation. Though in some measure all these approaches are being performed today in the Army, they are all expressions of theories. Each of these programs is nothing less than a qualitative management program designed to bring forth changes in management controls. The change necessary for the Army is not which program to use but rather the center of gravity the Army chooses to approach. Clausewitz maintained a nation must direct all of its efforts at a center of gravity. This center of gravity is "the hub of all power and movement, on which everything depends. That is the point against all our energies should be directed."<sup>40</sup> The center of gravity for qualitative management programs is the "people" who are to apply the program. The point where all energies should be directed is on the people not the program. The program will not work if leaders can not influence the people to use the program. The Army must focus on the people, not just a program of the month.

Jomini introduced the decisive point as strategic points, "whose importance is constant and immense... called DECISIVE strategic points."<sup>41</sup> Jomini further defines points as decisive—"those which are capable of exercising a marked influence either upon the result of a campaign or upon a single enterprise."<sup>42</sup> The decisive point for military transformation as a single enterprise in the use of any qualitative management program is leadership and its effect on people of the organization. Success of L6s, TQM, TQL, and ISO 9000 depends heavily on the leadership of the Army and how consistently leaders obtain a shared vision with the soldiers and civilians of the command.

To be successful in meeting the Secretary of Defense's objective for business transformation, the Army can not use L6s alone as a tool for strategic qualitative management change. The Army must check its Strategic Management system for its consistency and operational flexibility. It may be in danger of spending too many resources on the process and not on the product delivered. L6s is not a panacea. It is not a stand alone process, ways or means to reach an ends. The Army can not increasingly rely on L6s as a cure all for the problems that often plague the service. The Army's most valuable resource is its people.

The strategic management systems used by the Army must be people oriented and consider behavioral science effects. Senior Leaders must follow through, be persistent, and have a firm commitment, through sound leadership, to the Army's integrity in pursuing its' transformation vision. Systems thinking employ the same elements of Lean as it reduces waste and redundancy when properly used. The Army use of the Strategic Readiness System (SRS)<sup>43</sup> and the Balance Scorecard (BSC)<sup>44</sup> Report as means to identify organizational strategic goals and the metrics to measure the commands success in effect cancels out Six Sigma. The Army has developed hundreds of scorecards, cascading throughout commands, staffs, and industrial bases. The Army's deployment of BSC's throughout every level of command and staff demonstrates the depth and breadth of the Army's Balanced Scorecard initiative and leadership commitment to ensure its success. Results of this effort improved overall communication, accountability and performance measurement against the Army's strategic vision.<sup>45</sup> If the Army would properly use SRS, the BSC process and systems thinking (system of systems) there would not be a need for Lean Six Sigma.

Transformation is an intellectual exercise that begins with a strong program of education and leader development.<sup>46</sup> All leaders responsible for transforming the Army must be committed to continuous improvement of our total force while achieving the strategic goals of the Army. Clear leadership, accountability and management tools are required to enhance the Army's efforts to transform. Lean Six Sigma, Total Quality Management, Total Quality Leadership and International Organization for Standards 9000 all have one thing in common, people. In order for all qualitative management programs to be successful people have to buy into the use of the program. To get people to consistently use the management programs requires good leadership at the command and organizational level. The Army should be careful of overly technical and procedurally focused processes that lead to the creation of an excess of processes that change very little management programs already in place. Management programs move organizations; for good or bad, depending on how leadership employs and sustains the program. New programs introduced under the guise of military transformation can appear shallow, when existing programs are already in place.

Lean Six Sigma is redundant to the Army's use of the Strategic Readiness System (SRS) and the Balance Scorecard (BSC) Report as means to identify organizational strategic goals and the metrics to measure the commands success. Using TQM, TQL, or ISO 9000 along with the DA mandated SRS process is a sufficient management tool for commanders and leaders to exercise control and reduce inefficiencies of the organization. The Army should save its resources of time, dollars and people by applying effective and consistent leadership and using

the existing Strategic Readiness System to manage itself. Successful employment of any program relies on the quality of leadership employed to execute and sustain the program.

#### Endnotes

<sup>1</sup>Stephen G. Haines, *The Systems Thinking Approach to Strategic Planning and Management*, (St, Lucie Press, New York, Washington D.C., 2000), 346.

<sup>2</sup>Lan Doyal, International Forum, "Learning about Leadership through Others," (Wharton Leadership Digest, February, 2000); available from [http://leadership.wharton.upenn.edu/l\\_change/other\\_organizations/international\\_forum.shtml](http://leadership.wharton.upenn.edu/l_change/other_organizations/international_forum.shtml); Internet; accessed 4 December 2005.

<sup>3</sup>Donald H. Rumsfeld, *The National Defense Strategy of the United States of America* (Alexandria, Va: The Pentagon, March 2005), 11.

<sup>4</sup>Ibid., 10.

<sup>5</sup>Ibid., 10,11.

<sup>6</sup>Haines, 347.

<sup>7</sup>Defense Department, *Business Transformation Planning Guidance*, Draft Version 1.0 (Alexandria, Va: 25 October 2005), 1.

<sup>8</sup>Ibid., 5.

<sup>9</sup>Chief of Staff of the Army, Top Three Priorities can be found on the S-1 Net, DA, G-1, S1 NET <https://s1net.bcks.army.mil:443/s1net/>; Internet; accessed 27 October 2005. The CSA recently re-established the Army's top three priorities as follows:

1. Win the Long War while sustaining the All-Volunteer Force - recruit and retain Soldiers, while providing a quality of life commensurate with the quality of their service.

2. Accelerate the Future Combat Force Strategy - resource and execute modular force conversions as rapidly as possible, enable early spinout of Future Combat System technologies, and execute the global restationing plan of the Total Army.

3. Accelerate Business Transformation and Process Improvements.

<sup>10</sup>James P. Womack and Daniel T. Jones, *Lean Thinking* (Simon and Schuster, 1996), 15.

<sup>11</sup>Ibid.

<sup>12</sup>Bonnie Smith, "Lean and Six Sigma, A One- Two Punch" *Quality Progress Magazine*, (April 2003): 37.

<sup>13</sup>Ibid.

<sup>14</sup> U.S. Department of the Army, *Army Industrial Base Process*, Army Regulation 700-90 (Washington, D.C.: U.S. Department of the Army, 14 December 2004), 44. Industrial base: The privately owned and Government-owned industrial capability and capacity available for manufacture, maintenance, modification, overhaul, and/or repair of items required by the United States and selected allies, including both the production base and maintenance base.

<sup>15</sup> Green Belt Training; available at <http://www.amc.army.mil/Lean/policydocs/Overview%20of%20POI.doc>, Internet; accessed 25 January 2006. L6s Green Belt Course - A 14 module course that seeks to lay the groundwork for the commonality of language and approach for the AMC L6s deployment; it starts with the elucidation of Lean and Six Sigma and goes on to merge the two to form an integrated Lean Six Sigma program of merged tools and techniques.

ISO Internal Auditor - A single module that focuses on Gap Analysis and Trace; and Forward/Trace Backward. Introduction to Creative Problem Solving (CPS) - A single module that introduces the practitioners to the psychometrics used in the HQAMC methodology to form and guide teams and introduces them to some of the more commonly used CPS tools and techniques.

<sup>16</sup> Black Belt Training; available at <http://www.amc.army.mil/Lean/policydocs/Overview%20of%20POI.doc>, Internet; accessed 25 January 2006. Green Belt +, L6s Black Belt Course - Two weeks course of study (separated by ~ 2 months) consisting of 16 modules which go into detail on the tools and techniques of L6s with respect to Process Flow/Cause & Effect Analysis/ elucidation of Controlled, Noise, and Experimental variables/establishment of Standard Operating Procedures to take the "Controlled" variables out of the equation/Failure Mode and Effects Analysis to account for the Noise variables/Design Of Experiment to identify the critical few variables and optimize their output.

VIEW - This is a psychometric tool that has three dimensions to measure orientation to change, manner of processing data, and ways of making decisions; Black Belt candidates become certified to administer and score the VIEW instrument (Proprietary to the CPS Group-Buffalo)

Myers-Briggs Type Indicator - This is a psychometric that seeks to identify the preferences people have in the make-up of their psychological type; specific emphasis in this psychometric is with reference to how people take in data and how people interface with the outside world - Black Belt candidates become certified to administer and score the MBTI instrument (Proprietary to Consulting Psychologist Press which has franchised only a limited number of providers)

Basic CPS - Levels I-III of CPS (commonly referred to as "Igniting Creative Potential") in which the Black Belts are taught many tools and techniques to guide both explorer and developer-type groups to come to either adaptive or innovative solutions to problems subject to the desired output

L6s Black Belt Course - Two weeks course of study (separated by ~ 2 months) consisting of 16 modules which go into detail on the tools and techniques of L6s with respect to Process Flow/Cause & Effect Analysis/ elucidation of Controlled, Noise, and Experimental variables/establishment of Standard Operating Procedures to take the "Controlled" variables out

of the equation/Failure Mode and Effects Analysis to account for the Noise variables/Design Of Experiment to identify the critical few variables and optimize their output.

ISO Lead Auditor Course - An International Register of Certified Auditors (IRCA) certified course resulting in the testing of proficiency as auditors IAW ISO 9001:2000 (Proprietary to the Irish Quality Centre from whom we have a franchise to teach the IRCA certified course)

Black Belt Project - Plan and execute a project to generate "output" which a sponsor can then turn into "outcome" through its implementation (N.B. output is the responsibility of the Black Belt but outcome is the responsibility of the sponsor as the project owner)

<sup>17</sup>Master Black Belt Training; Green Belt Training available at <http://www.amc.army.mil/Lean/policydocs/Overview%20of%20POI.doc>, Internet; accessed 25 January 2006. Black Belt +, Ethical Execution of the Deployment/Campaign Plan - The ethics of what we do as Black and Master Black Belts with respect to the use of psychometrics, the proprietary nature of personal data, the protection of proprietary data, the selection and training of Master Black Belts, and the methodology of implementing the deployment plan (includes ethics IAW the American Psychological Association guidelines with respect to the use of psychometric and climate survey instruments)

CPS Train-the-Trainer - Level IV CPS in which the Master Black Belts become certified to teach Levels I-III (Proprietary to CPS Group-Buffalo; although I (and anyone else who is Level V certified) am certified to do this, I use CPS Group-Buffalo as a quality check)

L6s Instructor Training - Murder Board format in which the MBB candidates present instruction of selected modules from the GB, BB, CPS, and QMS courses

ISO Registered Provisional Auditor - The registration of Master Black Belts as Provisional Auditors and the conduct of requisite 3d party audits to transition to Registered Auditor/Lead Auditor (Proprietary to either IRCA or RAB)

Deployment/Campaign Planning - A course in strategic planning that combines the methodology of the development of a 5-paragraph field order with Creative and Critical Problem Solving tools and techniques to produce a detailed plan for the deployment of a L6s Initiative, i.e., a series of projects with a broad scope usually covering an extended period of time to execute

Situational Outlook Questionnaire - Certification in the administration and scoring of a statistically significant "command" climate survey instrument (Proprietary to CPS Group-Buffalo)

Mentor 2 Black Belt Projects - Mentor two BB projects from inception to output

<sup>18</sup>Benjamin Griffin, "The Army is Lean Six Sigma," available from <http://www.amc.army.mil/lean/index.aspx>; Internet; accessed 3 October 2005.

<sup>19</sup>M.G. Mullen, Chief Naval Operations, "CNO Guidance for 2006 Meeting the Challenge of a New Era," available from [http://www.globalsecurity.org/military/library/policy/navy/cno-guidance\\_2006.htm](http://www.globalsecurity.org/military/library/policy/navy/cno-guidance_2006.htm) ; Internet; accessed 26 January 2006.

<sup>20</sup>Department of Defense, USJFCOM J-9, *Net Assessment Concept Primer* (Washington, D.C., October 03) quoted in Department of Defense, Joint Warfighter Center, Pamphlet 7 (Washington, D.C.: U.S. Department of Defense, 17 November 2004), 5-10.

<sup>21</sup>United States Joint Forces Command, *Operational Net Assessment*, available from [http://www.jfcom.mil/about/fact\\_ona.htm](http://www.jfcom.mil/about/fact_ona.htm); Internet; accessed 26 January 2006.

<sup>22</sup>Department of Defense, USJFCOM J-9, 5-17, 5-18.

<sup>23</sup>Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton, New Jersey; Princeton University Press, 1976), 95.

<sup>24</sup>Peter M. Senge, *The Fifth Discipline, The Art & Practice of the Learning Organization* (New York, New York, Doubleday, 1990), 68-69.

<sup>25</sup>Russell Ackoff, *Ackoff's Best: His Classic Writings on Management*, (New York, John Wiley & Sons, 1999), 17; quoted in George Reed, *Systems Thinking and Senior Level Leadership, An Introductory Essay* (Carlisle Barracks, Pa: U.S. Army War College), 233.

<sup>26</sup>George E. Reed, *Systems Thinking and Senior Level Leadership, An Introductory Essay* (Carlisle Barracks, Pa: U.S. Army War College) quoted in James R. Oman, *U.S. Army War College Selected Readings, Fundamentals of Strategic Thinking* (Carlisle Barracks, Pa: U.S. Army War College, Academic Year 2006), 232.

<sup>27</sup>*Ibid.*

<sup>28</sup>*Ibid.*, 234.

<sup>29</sup>Department of Defense, USJFCOM J-9, 5-9.

<sup>30</sup>Haines, 281.

<sup>31</sup>*Ibid.*, 241.

<sup>32</sup>John Crager, "Revitalizing Six Sigma: What Matters Most to the Business," available from <http://logistics.about.com/od/initiatives/a/uc110104.htm>; Internet; accessed 16 June 2005.

<sup>33</sup>*Ibid.*

<sup>34</sup>*Ibid.*

<sup>35</sup>Paul Simson, Managing Partner, Work Systems Affiliates, International, Inc., telephone interview by Colonel George Reed, Director, Fundamentals of Strategic Thinking Course and Command and Leadership Studies, U.S. Army War College, and author, 22 November 2005.

<sup>36</sup>Mike George, Dave Rowlands and Bill Kastle, *What is Lean Six Sigma?* (McGraw-Hill: New York, NY, 2004), 92.

<sup>37</sup>Palmer.

<sup>38</sup>Devane, 350.

<sup>39</sup>Crager.

<sup>40</sup>Clausewitz, 595-596.

<sup>41</sup>Baron de Jomini, *The Art of War*, translated from French by G.H. Mendell and W.P. Craighill (Westport, Connecticut: Greenwood Press, 1863), 77.

<sup>42</sup>*Ibid.*, 78.

<sup>43</sup>ARNEWS, "New Scorecard Gives Holistic Readiness Picture," available from [http://www4.army.mil/OCPA/print.php?story\\_id\\_key=755](http://www4.army.mil/OCPA/print.php?story_id_key=755); Internet; accessed 27 January 2006. In addition to the traditional Unit Status Report, the Army just started using an initiative called the Strategic Readiness System to give a more holistic view of readiness. While the USR quantifies the readiness of personnel, equipment and training of combat units, SRS will also capture information on installations, infrastructure, Well-Being, the nation's industrial base and sustainment readiness. Department of the Army Headquarters staff sections and major military commands started using the new system in June. Its use will eventually expand down to division and separate brigades, officials said.

<sup>44</sup>Balanced Scorecard Collaborative worked closely with the US Army to provide the technology and consulting support needed to implement the Balanced Scorecard, later renamed the Strategic Readiness System (SRS). Specific tools were employed to address each of the challenges the Army faced during implementation.

To manage the BSC initiative, the Army established a central operations center at Headquarters, Department of the Army, staffed by Army and BSCol personnel. The HQDA SRS Operations Center supported Army organizations around the US and the world as they developed and implemented their scorecards. Given the breadth and depth of the needed cascade, as well as the need to rapidly cascade the scorecard throughout the Army, it was clear from the onset that technology was needed to leverage the available HQDA SRS Operations Center staff and resources.

The Balanced Scorecard Army Portal (BAP) consolidated all BSC learning resources in one central repository, and consisted of a library of exclusive BSCol and SRS content, eLearning, and Design Centers. Web-based training and learning provided an effective way to deliver initial training and refresher training on a real time basis anywhere in the world. The Design Center enabled consistent and aligned Balanced Scorecard development throughout multiple levels of the Army. Available from [http://www.bscol.com/bsc\\_portal/success/army/](http://www.bscol.com/bsc_portal/success/army/); Internet; accessed 2 February 2006.

<sup>45</sup>Balance Scorecard Collaborative, "Aligning 1.5 Million Men and Women Around the Mission;" available from [http://www.bscol.com/bsc\\_portal/success/army/](http://www.bscol.com/bsc_portal/success/army/); Internet; accessed 2 February 2006.

<sup>46</sup>Henry H. Shelton, "Professional Education: The Key to Transformation," *Parameters* 31 (Autumn 2001): 7.

